

Controlling for Prices before Estimating SPM Thresholds and the Impact on SPM Poverty Statistics

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Abstract

Supplemental Poverty Measurement (SPM) thresholds are computed using out-of-pocket spending on food, clothing, shelter, utilities (FCSU), with a multiplier to account for non-work related transportation and personal care. The source of these data is the U.S. Consumer Expenditure Survey (CE). For the production of the thresholds, price adjustments are applied twice: once to update the most recent five years of CE data to threshold year dollars, and second to produce SPM thresholds for over 300 hundred geographic areas. This latter adjustment is applied to the shelter and utilities portion only to reflect local rent prices. However, spatial differences in shelter and utility costs are already embedded in the initial SPM thresholds; these differences are being ignored in the current estimation. The purposes of this research are to develop a method to determine whether spatial differences in housing costs exist and whether this is a problem for poverty measurement, and if it is a problem, to propose an approach to account for these differences before the SPM thresholds are estimated. A regression based approach is used to produce quality-adjusted normalized prices for housing using the CE. This initial research suggests that normalized prices vary across areas and by housing tenure group (i.e., for owners with mortgages, owners without mortgages, and renters). SPM thresholds that account for these differences result in increases in poverty rates (for select demographic groups) of 0.3 to 0.7 percentage points compared to results based on unadjusted expenditures.

Introduction

In the current production of the Supplement Poverty Measurement (SPM) thresholds, prices play two roles: one, to update five-years of consumer spending to threshold year dollars, and two, to adjust “national” thresholds so that they reflect geographically varying prices. The first adjustment is done using the All Items Consumer Price Index and is applied to the sum of expenditures for food, clothing, shelter, and utilities (FCSU) at the consumer unit level for consumer units with two children. These expenditures are further adjusted, through the use of an equivalence scale, to reflect the spending of consumer units composed of two adults with two children. Thresholds are produced for three housing tenure groups: owners with mortgages, owners without mortgages, and renters. These “national” reference unit thresholds are next adjusted to account for the differences in composition (adults and children). An additional adjustment is applied to only the housing (shelter plus utilities) portion of the thresholds to reflect differences in prices across areas. This interarea price adjustment, a median rent index, is based on American Community Survey data (see Fox 2017). This results in the production of price adjusted thresholds for 364 areas across the U.S. Research continues on how best to account for geographic differences in prices across areas, for example, see Renwick (2011) and Renwick, Aten, and Figueroa (2014, 2017).¹ However, even with that research, geographic differences in prices across areas have thus far been ignored in the *initial production* of the two-adult-two child SPM thresholds which are based on Consumer Expenditure Survey (CE) data. Thus, differences in prices across areas are implicit in the BLS produced thresholds. This was pointed out recently by Bishop, Less, and Zeager (2017). Thus, a third role of prices needs to be explored. The focus of the current research is to produce geographic adjustments – normalized-quality adjusted prices-- that account for spatial differences in prices across areas using CE data, use these to adjust housing expenditures before the two-adult-two child SPM thresholds are estimated, produce thresholds that reflect these adjustments, and produce poverty statistics to determine if this third role of prices is of sufficient concern for further research and development.

As noted above, not accounted for in the SPM thresholds however are differences in housing prices across areas and by housing tenure before the thresholds are estimated; thus, spatial distributions in shelter and utility prices are ignored. Bishop et al. (2017) proposed a simple way to correct for this lack of spatial or geo-price differences in the initial 2A2C thresholds using data from the Census Bureau. These authors constructed housing tenure regional price parities (RPPs) by assigning each SPM resource unit, in the Census Bureau SPM research data file, its regional price parity and then calculated the average of these by housing tenure groups. This information was used to adjust the housing portion of the SPM thresholds. Unlike in the current study, these authors then applied another regional price adjustment for food, apparel, and rent (FAP) from the research of Renwick et al. (2014).

The focus on the current research is to more directly account for different spatial distributions of housing prices and tenure groups before estimating the thresholds. As a prototype—and experimentally—we produce geographic quality-adjusted normalized prices separately for owners and for renters, apply these to consumer unit level shelter and utility expenditures before threshold construction. After adjusting for spatial differences in housing and prices across geographic areas, “new national average” reference unit thresholds are produced. These new thresholds are then sent to the Census Bureau for a second geographic adjustment; this step is followed to convert the new national average thresholds into local area SPM thresholds. This second geographic adjustment is applied to the housing share of the reference unit SPM thresholds only, unlike the CE-based adjustment which is applied at the CU level before threshold construction.

¹ As noted by Renwick et al. (2014), a research forum sponsored by the University of Kentucky Center for Poverty Research (UKCPR), in conjunction with the Brookings Institution and the U.S. Census Bureau made suggestions on the geographic adjustments to the poverty threshold. These included the use of quality-adjusted price levels, differentiation by metropolitan areas within states and the inclusion of other components of the consumption bundle.

The geo-price adjustments are limited to housing defined in terms of expenditures for shelter plus utilities. Renter price adjustment are based on rents plus utilities, and owner expenses (not counting mortgage interest or principal payments) plus utilities. We consider the other components (food and clothing) of the thresholds to be tradable and thus assume that their prices do not vary by geography. Also for this analysis, we do not consider the prices of telephone services as geographically varying and thus do not count expenditures for these services in the normative price adjustment estimation. Telephone services also are not counted in the housing shares sent to the Census Bureau to produce local area geographically adjusted SPM.

For this study, we limit our analysis to the 2014 threshold year and thus CE data from 2010 quarter two-2015 quarter one are used. Geographic area normative prices are produced for those areas in which CE data are collected, with primary sampling units representing non-metro urban, small metro, and rural areas regrouped. Quality-adjusted normative prices are based on weighted log-linear expenditure regressions using pooled samples of data from these five years. The method controls for differences in housing unit characteristics with geo-adjusted prices produced for 42 areas (38 CPI areas plus four rural areas). Our basic approach follows that used by Martin, Aten, and Figueroa (2011) in their exploration of rent RPPs using the Consumer Price Index (CPI) Housing Survey and the American Community Survey. We compare and contrast the CE-based geo prices using the pooled five years of CE data to rent (rents for renters and rental equivalence for owners) RPPs produced by the Figueroa (2017) using the 2014 CPI Housing sample.

Due to the fact that SPM thresholds are based on out-of-pocket (OOP) spending, we propose that the preferred prototype geo-price adjustment is based on OOP spending on “like” housing expenditures, that the adjustment is made to housing (shelter+utilities) before SPM thresholds are estimated. For renters, we suggest adjusting housing expenditures by quality adjusted normalized rent prices. The rent sample includes all renters, with the exception of consumer units living in student housing, with positive rents. For owners, our quality adjustment normalized owner prices are based on housing expenditures that owners with and without mortgages would be expected to have; these include property taxes, home owners insurance, maintenance and repairs, etc. To be included in the owner sample, the sum of property taxes plus insurance had to be positive. Even though mortgage principal payments and interest are included in the SPM thresholds, we did not include these in the geo-adjusted prices calculation as they are more dependent on mortgage terms and less on characteristics of the housing.

This study suggests that adjusting for spatial differences in housing costs across areas before estimating the initial 2A2C SPM thresholds is something that needs to be considered. The impact on thresholds and subsequently on poverty rates is important. The impact is greater on owners without mortgages and on renters than on owners with mortgages. The poverty rate for the U.S. increases from 15.3 percent to 15.6 percent. Poverty rates for the follow groups of individuals however do not change statistically: owners with mortgages, those living in the Northeast, and those living in the West.

Definition of Housing Expenditures for SPM thresholds and Normalized Prices

For SPM thresholds, out-of-pocket expenditures for shelter and utilities for consumer units’ primary residence and rental units are included. Consumer units living in student housing are not included in the SPM estimation sample. Owner shelter expenses include mortgage principal payments, interest on mortgages, property taxes and insurance, ground rent, expenses for property management and security, homeowners’ insurance, fire insurance and extended coverage, expenses for repairs and maintenance contracted out, and expenses of materials for owner-performed repairs and maintenance for dwellings used or maintained by the consumer unit. Renter shelter expenses include rent paid for dwellings, rent received as pay, parking fees, maintenance, and other expenses. Rental shelter expenditures reported by consumer units living in subsidized rental units, public housing, or rent controlled units are those paid by the CU and do not include the value of any subsidies. The owner and renter samples include consumer units who occupy their units without payment of cash rents. Utilities include those for natural gas; electricity; fuel oil and other fuels, such as wood, kerosene, coal, and

bottled gas; water and other public services, such as garbage and trash collection, sewerage maintenance, septic tank cleaning; and telephone charges. Any subsidies received in-kind for utilities are not counted.

For CE-based normalized prices, expenditures for shelter and utilities are considered as one bundle representing housing and are referenced as such throughout the remainder of the paper. Counting both shelter and utilities together in the estimation of the CE-based indexes is consistent with the approach followed by Renwick (2011) in the production of the American Community Survey (ACS) median rent index (MRI). There are two primary differences in the definition of housing expenditures used for the normalized prices estimation and for the SPM thresholds: (1) telephone expenditures are not included in utilities; and (2) owner expenses do not include mortgage principal payments and interest. Not including telephone expenditures in utilities is consistent with the ACS MRI produced by Renwick (2011) and by Martin, Aten and Figueroa (2011) and Renwick, Aten, and Figueroa (2017) for the rent portion of the BEA regional price parities using the ACS, and for BEA team's produced first stage rent regional price parities based on the CPI Housing Survey. The exclusion of mortgage interest and principal allows us to produce normative prices that are based on more similar types of expenditures for owners with and without mortgages. In addition, mortgage related expenses are expected to be more dependent on mortgage terms and less on characteristics of the housing across areas.

In order to better understand the differences in the CE-based indexes and inter-area adjustments produced by Renwick (2011) and the BEA researchers, further differences are noted. First, the ACS MRI is based on median rents plus utilities for 2-bedroom apartments with complete kitchens and plumbing while the CE-based indexes are quality-adjusted weighted geometric means estimated using a hedonic model that controls for housing unit characteristics. The hedonic model is similar to those used by BEA for the production of rent RPPs using the CPI Housing Survey of rents for renters and rental equivalence for owners. Second, rents are defined differently for the BEA indexes as opposed to those used for the production of the ACS MRI and the CE-based normative prices produced in this study. As noted earlier, the BEA rent RPPs for the first stage of the overall RPPs, and used for comparison in this study, are based on rents and rental equivalence collected using the BLS CPI Housing Sample; this is the same sample used by the BLS for the production of the CPI rent index. This rent includes what the tenant pays plus the value of rent as pay and rental subsidies paid to landlords as applicable. Not included in the CPI Housing Sample of renters are student or public housing (Penvose 2017). Expenditures for utilities are not counted as CPI rent unless already included in reported rents. Not including these additional utilities is consistent with the approach used by the BEA researchers in the production of rent RPPs using data from the American Community Survey. The variable used by the BEA researchers is contract rent: "the monthly rent agreed to or contracted for, regardless of any furnishings, utilities, fees, meals, or services that may be included. For vacant units, it is the monthly rent asked for the rental unit at the time of interview" (Census 2016).

Geographic Areas

Table 1 (located on last page of paper) includes the areas for which quality-adjusted normalized prices are produced using the CE data. CE primary sample units (PSUs) were regrouped to match the areas represented by BLS CPI area definitions in effect prior to 2005 quarter two² with the addition of four rural areas for the CE alone. The earlier CPI area groupings are used in order to match the areas for which the BEA researchers produced normalized prices or rent RPPs (Aten et al. 2016; Martin et al.

² With 2005 quarter two, PSU area A212 (Milwaukee-Racine, WI) was demoted to X212, A213 (Cincinnati-Hamilton, OH-KY-IN) was demoted to X218, A214 (Kansas City, MO-KS) was demoted to X226. In 2006 quarter two, A209 (St. Louis, MO-IL) was demoted to X214. However, for the purposes of this study, these areas maintained their earlier designations in order to match the geographic areas. The PSU variable is selected to represent a type of area and having one city or another represent the area is not important for intra-area price indexes.

2011) using the CPI Housing Survey data. Four rural areas -- Northeast, Midwest, South and West -- are included in the CE sample but not the CPI Housing Survey sample. The CPI areas include 31 “urban, metropolitan areas”, 4 “small metropolitan areas”, and 3 “urban, nonmetropolitan” sample areas. Figueroa (2017) provided us with rent RPPs for these 38 areas. We follow an earlier convention used by the BEA researchers and assign certain of the 2014 first stage rent RPPs to the rural areas in order to make a full U.S. comparison: rural northeast is assigned the same rent RPP as for Northeast small metro, rural Midwest is assigned the Midwest nonmetropolitan urban RPP, rural South is assigned South nonmetropolitan urban, and rural West is assigned West nonmetropolitan urban.

One might ask why not use the MRI adjust CE housing expenditures. We chose not to do this as the CE and ACE sampling methodologies and survey designs are different. Our aim was to use the data underlying the thresholds and make adjustments with the data available. In the results section, we compare our CE based normalize prices to rent RPPs based on the CPI Housing Survey, and thresholds based on both. However, we do not recommend that these indexes be applied to the CE housing expenditures as rural areas are not included in the CPI Housing Survey sampling frame.

For future reference, note: In January 2018, BLS will introduce a new geographic area sample for the Consumer Price Index (CPI); the new geographic area sample was introduced for the CE in 2015. These new samples are based on the 2010 Decennial Census.

Geographic Price Adjustment Method

In order to derive the quality-adjusted normative prices that measure differences across areas for 2014, we follow the regression used by Aten and colleagues (e.g., Martin et al., 2011) in their production of RPPs based on the CPI Housing Survey rent sample. For the estimation of CE-based prices, owner and renter shelter expenditures must be positive. The log of renter or owner housing expenses are regressed on area dummy and control variables. PROC GLM in SAS is used for the analysis; all results are population weighted. Relative differences in renter and owner expenses across areas are represented by the area coefficients, holding all other characteristics constant. Differences in expenditure levels across areas are derived using the SAS statement LSMEANS by area. The geometric mean across index areas, weighted by the CE population weights, is equal to 1.0 for each housing tenure group, renters and then owners.

To derive the CE-based prices, we pool five years of CE data that match the years for the production of the SPM thresholds. The resulting indexes represent the relative price levels of rents plus utilities and of owner expenses including utilities across areas controlling for basic housing unit characteristics. The following variables are included as controls in both the renter and owner regression models: type of structure, number of bedrooms, number of bathrooms, number of half baths, the total number of rooms, whether the unit has central air conditioning, whether the unit has off street parking, and dummy variables for the survey years. In addition, the rent model includes the following: whether energy utilities are included in the rent, whether water and trash pickup are included in the rent, if the unit is in public housing, whether the unit is subsidized housing, whether the unit is rent controlled, and whether part of the rent is as pay. The additional owner regression model variables include whether the unit has a porch or balcony and if the unit is mortgaged or not.

Results of Regression Estimation

Summary results of the regression analysis and an examination of the CE-based normalized prices relative to rent RPPs produced by Figueroa (2017) for 2014 are presented in this section. Median rent indexes (MRIs) for 2014 and 2015, derived from the American Community Survey and produced by (2017) Renwick and Renwick et al. (2017), are also compared to those derived from the CE.

Table 2 includes the CE-based results for the rent and owner expenditure log linear models. Over the 2010-2014 time period, about one third of the CE weighted sample were renters and the other were owners. The rent plus utilities model provides a better overall fit to the data than does the one for owner expenditures, although both are consider good for cross-sectional analysis. These results are in line with those produced for rents using 5 years of ACS data by Martin et al. (2011).

Table 2. Overall Fit of Log-linear Weighted Regression Models: CE Results		
Dependent Variable	R Square	Unweighted observations
Rent plus utilities	0.397	44,240
Owner shelter expenses plus utilities	0.342	82,396

Table 3 includes simple correlations of the CE-5-year based quality-adjusted normalized prices with the rent RPPs for 2014. These are presented for all areas and then separately for different size areas noted by A, D, X and R (see Table 1 for definitions). Normalized prices for renter shelter and utilities are more highly correlated with the rent RPPs than are the normalized prices faced by owners. The lower correlations of owner shelter and utilities normalized prices with the rent RPPs (overall correlation=0.707) are notable. Like the SPM thresholds, CE normalized prices are based on out-of-pocket spending; in contrast, the rent RPPs are based on rental equivalence for owners. These results suggest that if one were to adjust housing expenditures by rent RPPs, rather than an adjustment based on out-of-pocket spending, resulting thresholds would not adequately reflect the prices faced by owners in their out-of-pocket spending.

Table 3. Correlations of CE Based Normalized Rent Prices with CPI Housing Survey Based Rent RPPs					
	BEA Rent (rent and rental equivalence) RPP (CPI Housing Survey 2014)				
Quality-Adjusted Normalized Rent Prices (CE Interview 2010-2014 pooled)	All Areas	A Areas	D Areas	X Areas	R Areas
Renter shelter and utilities	0.964	0.954	0.836	0.998	0.999
Owner shelter (non-mortgage related) and utilities	0.706	0.617	0.467	0.706	0.841

Geographic normalized prices based on the pooled CE Interview data from 2010-2014 are presented in Charts 1 and 2 with those for rents followed by those for owner housing. These are ranked from lowest normalized prices to highest. Normalized prices for renter housing and for owner housing are lowest in the Rural South and highest in the New York City area for rents and in the New York-Connecticut Suburbs for owner prices.

Chart 3 includes normalized prices and rent RPPs for select areas. Owner prices are highest in the New York-Connecticut Suburbs and the New Jersey Suburbs, compared to the national average. In contrast, the most expensive area in which to live in the U.S., based on rent RPPs, is the San Francisco-Oakland-San Jose, CA area. Renter normalized prices are highest for New York City, but only marginally compared to the San Francisco-Oakland-San Jose, CA area. For New York City, renter and owner normalized prices are about the same; the rent RPP is quite similar as well.

For comparison, rent RPPs based on ACS data and Median Rent Indexes from the Renwick et al. (2017) study are presented in Chart 4. These are based on a new geographic structure that combines all the New York City areas and separates the San Francisco-Oakland-San Jose areas. Based on these results, the highest cost area in the U.S., based on rents (and or rents plus utilities) is the San-Jose-Sunnyvale-Santa Clara, CA area, followed by San Francisco-Oakland, and then New York. Again, the least expensive area, based on housing, is in the rural South.

Chart 1. CE Areas Ordered by Increasing Quality Adjusted Normalized Rent+Utility Prices based on CE Interview Pooled Data for 2010-2014

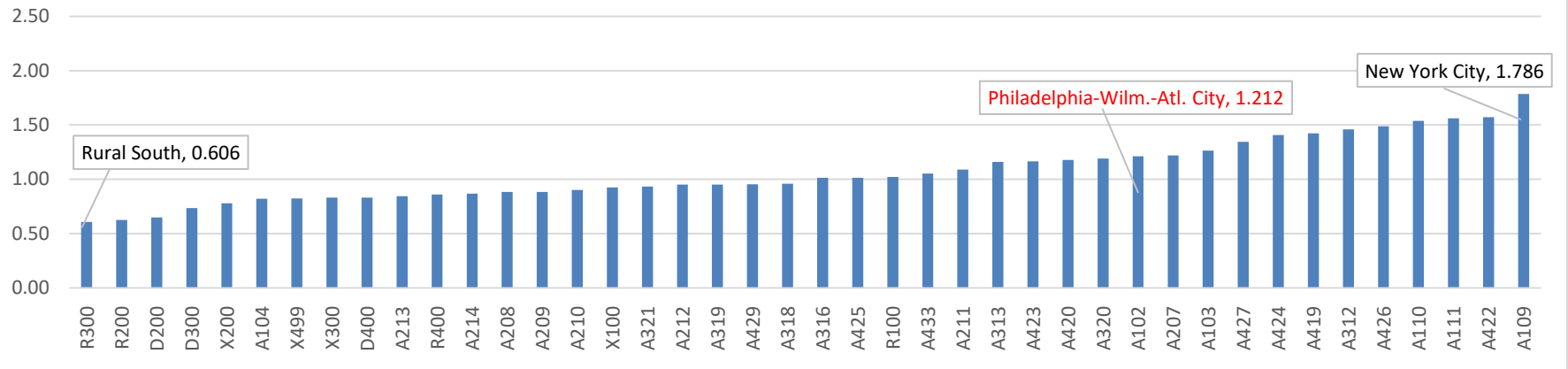
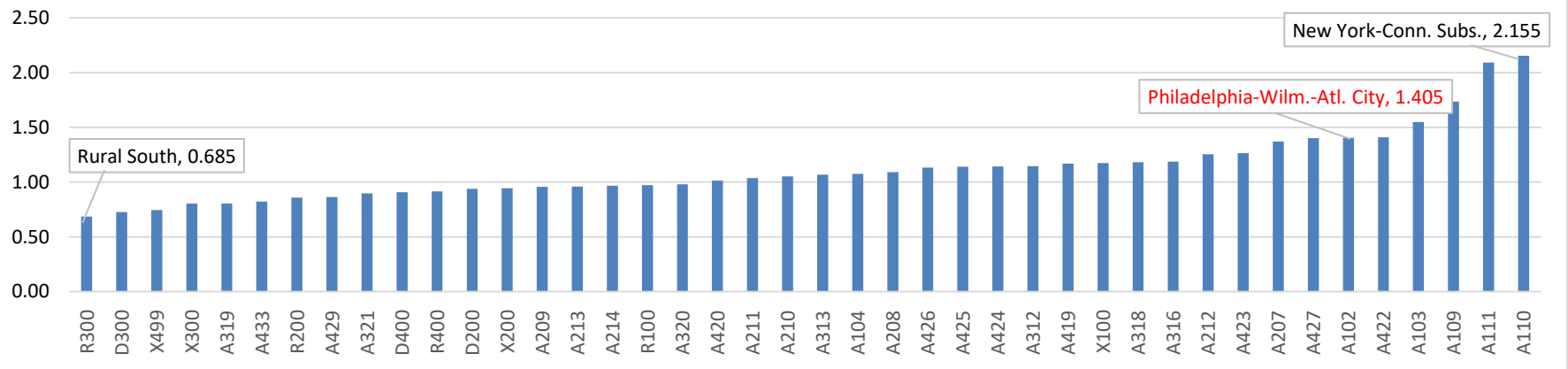
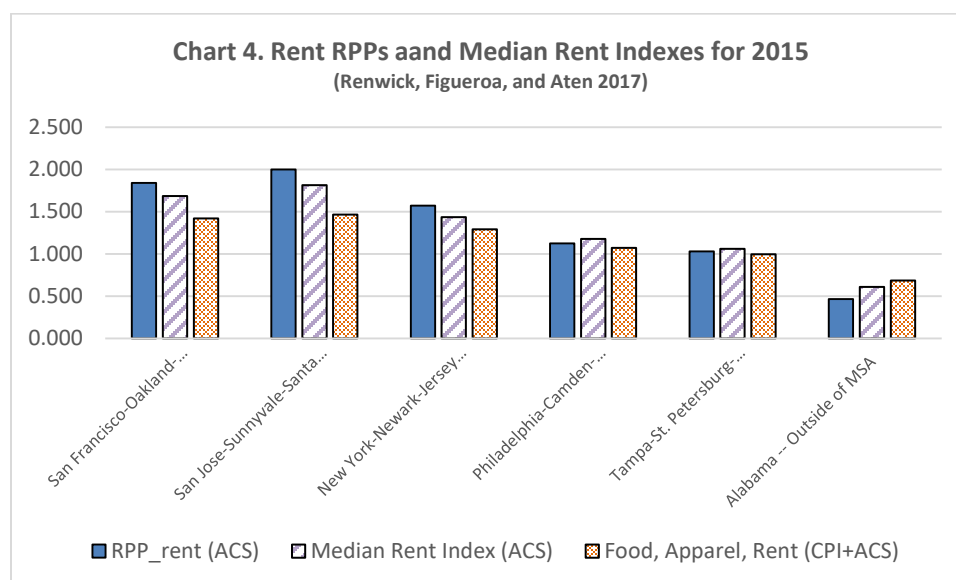
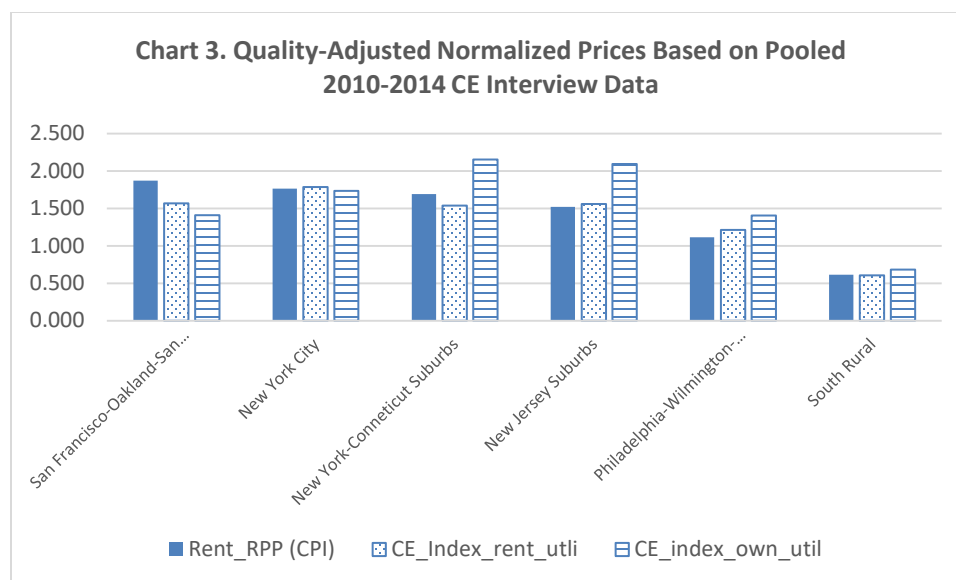


Chart 2. CE Areas Ordered by Increasing Quality Adjusted Normalized Owner (non-mortgage)+Utility Prices based on CE Interview Pooled Data for 2010-2014





The range of geographic adjustments are presented in Table 4. The Median Rent Indexes for 2014 and 2015 are presented first followed by the rent RPPs and then the CE normalized prices derived from the current study. The CE quality adjusted normalized prices for rents and renter utilities are similar to the MRI and rent RPPs.

Impact of Inter-Area Price Adjustment on SPM Thresholds for two Adults with Two Children

The impact of adjusting housing expenditures by geo-price adjustments before producing the SPM thresholds is discussed in this section. Before producing the thresholds, housing expenditures (not including those for telephone) for each consumer unit in the CE Interview Survey are adjusted by area specific geo-price adjustments or quality-adjusted normalized prices depending on the consumer unit lives. These adjusted housing expenditures are added to price unadjusted expenditures for food,

Table 4. Range of Geo Price Adjustment Values				
	MRI ^a		BEA Rent RPP (CPI)	This Study for 2014 (U.S.=1.00)
	2014	2015	2014	CE Normalized Rent+Utility Prices CE Normalized Owner Shelter (no mortgage)+Utility Prices
Maximum	1.78	1.81	1.87	1.79 2.16
Minimum	0.59	0.61	0.62	0.61 0.69
Range	1.19	1.20	1.26	1.18 1.47
Ratio of Max to Min	3.00	2.97	3.04	2.95 3.15

^a Based on 5-year American Community Survey median rents for 2-bedroom apartments with complete kitchens and plumbing (Renwick 2017; Renwick et al. 2017).

clothing, and telephone. Next these FCSU expenditures are converted to 2014 dollars using the all items CPI-U. As noted earlier, SPM thresholds are based on the experience of consumer units with two children; thus to arrive at the reference thresholds for two adults with two children FCSU expenditures are further adjusted using the 3-parameter equivalence scale. SPM thresholds for the reference unit are presented in Chart 5. The solid black bar represents the 2014 SPM thresholds produced by the BLS (BLS 2017) and used by the Census Bureau to produce SPM poverty statistics. For these thresholds telephone expenditures are included in shelter expenditures. Owners with mortgages thresholds are highest at \$25,844 followed by those for renters (\$25,460) and owners without mortgages (\$21,380). In the next bar are thresholds with telephone expenditures not included in shelter expenditures—this is the only difference from the first bar. This change only makes a difference in the thresholds for owners without mortgages-lowering their thresholds. Once housing expenditures are adjusted and telephone expenditures are not included in utilities, the third and fourth sets of bars result. When housing expenditures are adjusted for differences in CE normalized prices, SPM thresholds for owners with mortgages change little. Applying the rent RPPs to housing expenditures results in SPM thresholds that are markedly higher for all three housing tenure groups.

Chart 6 includes the SPM thresholds adjusted by the CE normalized prices, with telephone expenditures not adjusted, compared to thresholds based on the adjustment produced by Bishop et al (2017). The Bishop et al. adjustments are based on average rent RPPs across all areas in the U.S. using the ACS for 2012 for the three housing tenure groups. For these thresholds, only the share of housing expenditures in the estimated 2A2C SPM thresholds are adjusted; in other words, expenditures are not adjusted at the consumer unit level. For the comparison, we apply adjustment factors that these researchers produced, dividing 2A2C housing expenditures by: 0.9221 for owners without mortgages, 1.0024 for owner with mortgages, and 1.0528 by and for renters by 1.0528. Thresholds for renters are most affected.

Housing expenditure shares implicit in the 2014 SPM thresholds, published and reflecting geo adjustments, are presented in Table 5. Shelter shares remain approximately the same with and without geo-price adjustments ranging from about 17-18 percent for owners without mortgages to 36 percent for renters. Not surprisingly, the shares for utilities change due to the omission of telephone from utilities. For the adjusted thresholds, shares for utilities were also fairly stable for owners with mortgages (11 percent) and renters (8 percent). The utilities share however increased for owners without mortgages by about 2 percentage points, from 14.2 percent without the geo-adjustment to 16.5 percent depending upon the geo-index adjustment applied to the housing expenditure thresholds.

Chart 5. 2014 2A+2C SPM Thresholds with and without Geo-Price Adjustment Applied to Housing Share

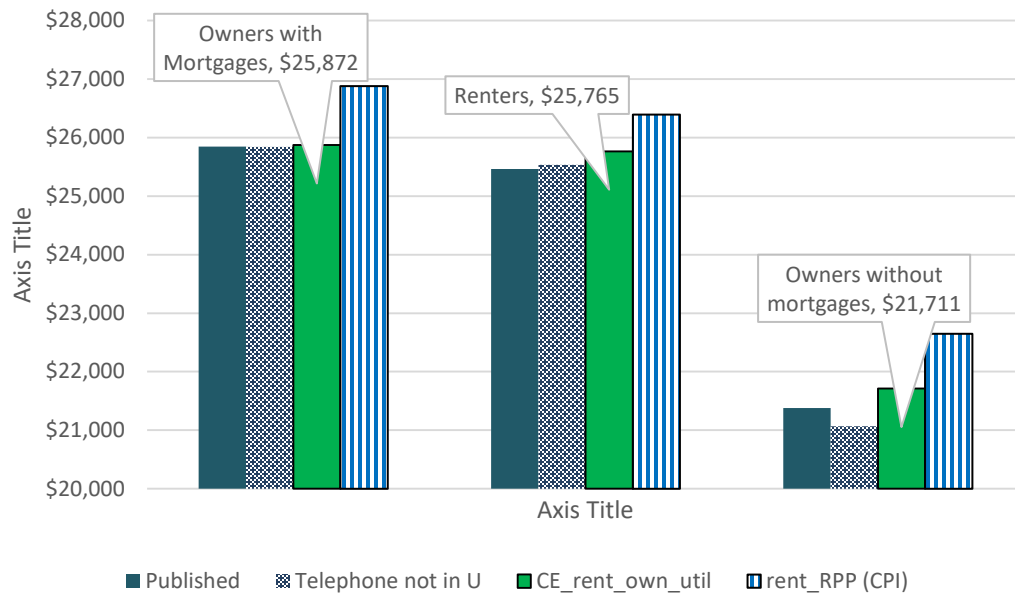


Chart 6. 2014 2A+2C SPM Thresholds with CE-Based Geo Price Adjustment Compared to Bishop et al. (2017) Adjustment

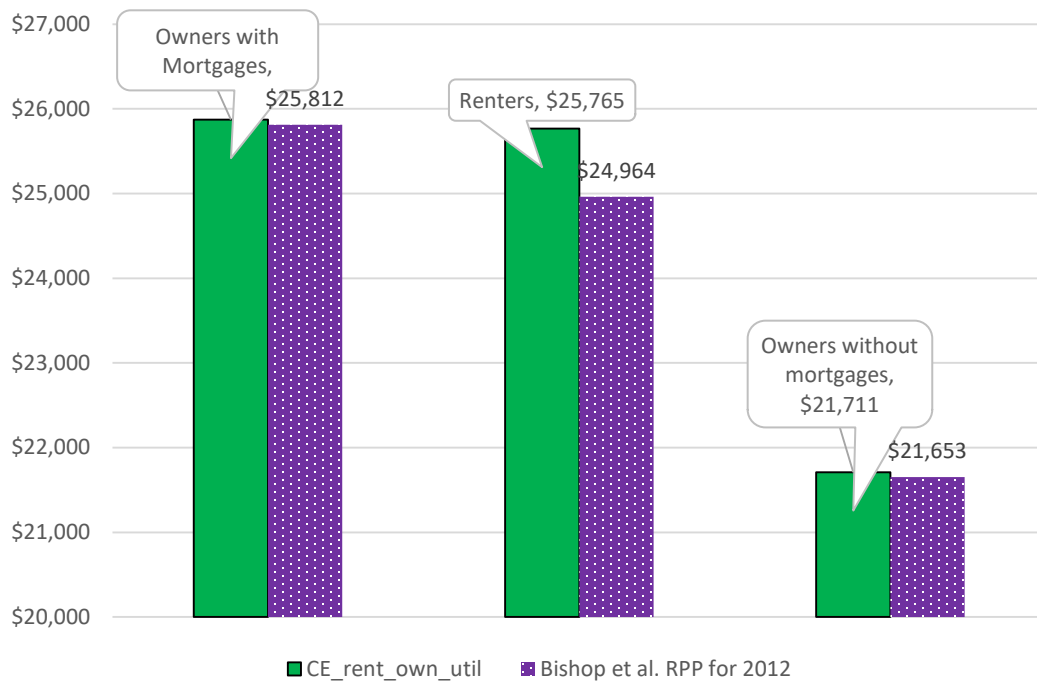


Table 5. Housing Expenditure Shares For 2014 2A+2C Unadjusted and Geo-Adjusted SPM Thresholds

		Published	Telephone not in Utilities	CE_Geo	Rent_RPP (CPI)
Owners with Mortgages					
	shelter	34.1%	34.1%	33.4%	34.2%
	utilities	16.6%	11.0%	10.9%	11.2%
	<i>housing total</i>	<i>50.7%</i>	<i>45.2%</i>	<i>44.3%</i>	<i>45.4%</i>
Renters					
	shelter	36.4%	36.3%	35.8%	35.8%
	utilities	13.6%	8.2%	8.3%	8.6%
	<i>housing total</i>	<i>50.0%</i>	<i>44.5%</i>	<i>44.1%</i>	<i>44.4%</i>
Owners without mortgages					
	shelter	18.3%	18.5%	17.1%	18.8%
	utilities	22.2%	14.2%	16.5%	16.3%
	<i>housing total</i>	<i>40.4%</i>	<i>32.7%</i>	<i>33.6%</i>	<i>35.2%</i>

Impact on Poverty Rates

Poverty rates are presented in Table 6 with and without telephone services included in housing, and with and without geo-adjustments applied to housing expenditures before estimating the 2A2C SPM thresholds. As a special request, Renwick produced poverty rates starting with the 2A2C SPM thresholds produced in this study, and then made the usual adjustments to produce thresholds for consumer units composed of other numbers of adults and children, and to produce local area thresholds. Not including telephone services in housing utilities, and thus not in the housing share that Renwick adjusts for geographic price differences, made no difference on overall poverty. However, when considering housing tenure, location of residence, and region, the results were mixed; in some cases rates increased and in others they decreased. The greatest impact on poverty rates resulted from the combined effect of not including telephone services in housing and from the CE-geo price adjustments by area. Poverty rates increased for all but owners with mortgages, and people living in the Northeast and West.

Table 6. Number and Percentage of People in Poverty Using Supplemental Poverty Measures 2014

(Number is thousands, margin of error in thousands or percentage points as appropriate. See <https://www.census.gov/content/dam/Census/library/publications/2015/demo/P60-254.pdf>)

Characteristic	Published	Telephone not in Housing Share	Geo-Adjusted in FCSU	Published-Telephone		Published-Geo Adjusted		Telephone-Geo Adjusted	
	Percent			Percent	Stat Sig.	Percent	Stat Sig.	Percent	Stat Sig.
All People	15.3	15.3	15.6	0.0		-0.3	*	-0.3	*
Tenure									
Owner	9.6	9.5	9.7	0.1	*	-0.1	*	-0.2	*
Owner/mortgage	8.1	8.0	8.0	0.0		0.0		0.0	
Owner/no mortgage/rentfree	13.0	12.8	13.4	0.3	*	-0.4	*	-0.7	*
Renter	26.1	26.3	26.8	-0.3	*	-0.8	*	-0.5	*
Residence									
Inside metropolitan statistical areas	15.8	15.7	16.0	0.1	*	-0.2	*	-0.3	*
Inside principal cities	20.2	20.1	20.5	0.1	*	-0.3	*	-0.4	*
Outside principal cities	13.1	13.0	13.3	0.2	*	-0.1	*	-0.3	*
Outside metropolitan statistical areas	12.8	13.5	13.8	-0.7	*	-1.1	*	-0.3	*
Region									
Northeast	14.7	14.5	14.8	0.2	*	-0.1	*	-0.3	*
Midwest	11.8	12.0	12.3	-0.2	*	-0.5	*	-0.3	*
South	15.6	15.9	16.2	-0.2	*	-0.6	*	-0.3	*
West	18.4	18.0	18.3	0.4	*	0.0		-0.3	*

NOTE: All calculations and resulting poverty rates produced by Trudi Renwick, Census Bureau (December 1, 2017) for this study and are for research purposes only.

Discussion and Conclusion

In the SPM thresholds used for poverty statistics, implicit differences in prices across areas exist. The underlying assumption is that these differences do not matter. However, this assumption is largely untested, with the possible exception of Bishop et al (2017). The purpose of this study was to examine the impact of accounting for spatial differences in housing prices across areas before estimating the SPM thresholds, and thus to make adjustments at the consumer unit level. To do this, first quality-adjusted normalized prices were produced using CE data, the same data that are used for the production of the SPM thresholds. Normalized area-specific prices were produced separately for owners and renters. For owners, only goods and services purchased by both those with and without mortgages (so no mortgages) were considered in the estimation of the normalized area-specific prices. The CE data were used in order to account for prices faced by renters and owners for shelter and utilities in their out-of-pocket expenditures. Other geo-adjustments available include the median rent index (MRI), the rent regional price parities (RPPs), and food-apparel-rent RPPs. However, neither the MRI nor RPPs account for the prices faced by owners with regarding to their out-of-pocket spending.

The preferred prototype approach is to adjust consumer unit specific housing expenditures for renters separately from owners, with both accounting for utilities, and not to include telephone in housing utilities. Thresholds based on this preferred approach result in SPM poverty rates that are higher than those based on unadjusted thresholds. Future work includes refining the hedonic model used to produce the normalized area-specific prices to account for more areas, and then to consider whether a multilateral index methodology would be appropriate.

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Table 1. Areas for Which Inter-Area Indexes Produced	
Area	Area Description
<i>In CPI Housing Survey Sample and CE Sample</i>	
A102	Philadelphia-Wilmington-Atlantic City, PA-NJ-DE-MD
A103	Boston-Brockton-Nashua, MA-NH-ME-CT
A104	Pittsburgh, PA
A109	New York City
A110	New York-Connecticut Suburbs
A111	New Jersey-Pennsylvania Suburbs
A207	Chicago-Gary-Kenosha, IL-IN-WI
A208	Detroit-Ann Arbor-Flint, MI
A209	St. Louis, MO-IL
A210	Cleveland-Akron, OH
A211	Minneapolis-St. Paul, MN-WI
A212	Milwaukee-Racine, WI
A213	Cincinnati-Hamilton, OH-KY-IN
A214	Kansas City, MO-KS
A312	Washington, DC-MD-VA-WV
A313	Baltimore, MD
A316	Dallas-Fort Worth, TX
A318	Houston-Galveston-Brazoria, TX
A319	Atlanta, GA
A320	Miami-Fort Lauderdale, FL
A321	Tampa-St. Petersburg-Clearwater, FL
A419	Los Angeles-Long Beach, CA
A420	Los Angeles Suburbs, CA
A422	San Francisco-Oakland-San Jose, CA
A423	Seattle-Tacoma-Bremerton, WA
A424	San Diego, CA
A425	Portland-Salem, OR-WA
A426	Honolulu, HI
A427	Anchorage, AK
A429	Phoenix-Mesa, AZ
A433	Denver-Boulder-Greeley, CO
D200	Midwest nonmetropolitan urban
D300	South nonmetropolitan urban
D400	West nonmetropolitan urban
X100	Northeast small metropolitan
X200	Midwest small metropolitan
X300	South small metropolitan
X499	West small metropolitan
<i>In CE Sample Only</i>	
R100	Northeast rural
R200	Midwest rural
R300	South rural
R400	West rural